UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,908	03/25/2004	David Walker Guidry	TI-37090	7410

23494 7590 10/27/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED	JEANGLAUDE, JEAN BRUNER	
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DALLAS, TX 75265	ART UNIT	PAPER NUMBER
	2819	

DATE MAILED: 10/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	**Applicant(s)**
Office Action Summary	10/808,908	GUIDRY, DAVID WALKER
	Examiner	**Art Unit**
	Jean B Jeanglaude	2819

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *3-23-04*.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 1, 2, 18, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by

Burns (US patent Number 5,589,763).

3.   Regarding claims 1, 18, 19, Burns discloses a successive approximation system

and method, comprising (fig. 5): a memory (218, fig. 5) having a successive

approximation value; and a comparison system (206, fig. 5) configured to amplify a

difference between a test signal and a signal indicative of the successive approximation

value to provide an amplified signal (col 5, lines 23 – 30) and to convert the amplified

signal to a digital signal (col 5, lines 27 – 30)

4.   Regarding claim 2, Burns discloses a successive approximation system (fig. 5),

further comprising logic (218, fig. 5) operative to adjust the successive approximation

value based on the digital signal (fig. 5).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 3 – 11, 13 - 23 are rejected under 35 U.S.C. 103(a) as being
unpatentable over Burns (US Patent Number 5,589,763).

7.   Regarding claims 3, 9, Burns discloses all the limitations as discussed above
including a successive approximation system (fig. 5), further comprising a clock source
(208, fig. 5) to produce clock signals, a signal generating circuit (200, fig. 5) to generate
and output a repetitive test waveform to a device under test in accordance with the
clock signals, the device under test outputting the test signal (note test signal), and a
pulse generating circuit (212) coupled to the clock circuit for producing sampling point
signals corresponding to sampling points spaced across the test signal based on the
clock signals (fig. 5) but does not explicitly disclose a successive approximation system
a comparison system further comprising a multi-bit analog to digital converter for
converting the amplified signal to the digital signal, the multi-bit analog to digital
converter having a range, the logic being responsive to adjust the successive
approximation value based on the digital signal to place the digital signal within the
range of the multi-bit analog to digital converter. However, it is noted in Burns that the
input signal (200) may be either an analog or digital signal. In applying a digital signal as
the input of Burns circuit an artisan in the art would recognize that an ADC will provide
the digital signal to Burns' circuit and Burns' circuit comprises a comparator (206) and
logic circuit (218). Therefore, it would have been obvious to one ordinary skill in the art
at the time the invention was made that Burns' would achieve the same end result as
the claimed invention performing a successive approximation routines.

8.   Regarding claims 4, and 21 Burns discloses a successive approximation system

and method (fig. 5) wherein the logic (218) appends the digital signal to the successive

approximation value to increase the resolution of the successive approximation value

after the digital signal is within the range of the multi-bit analog to digital converter [it is

inherent that the SAR would increase the resolution of the system] (fig. 5).

9.   Regarding claims 5, 22, Burns discloses a successive approximation system and

method (fig. 5) wherein the logic (218) calibrates the digital signal in accordance with

the successive approximation value after the digital signal is within the range of the

multi-bit analog to digital converter [it is inherent that the logic would calibrate the digital

signal].

10.   Regarding claims 6, and 20, Burns discloses a successive approximation system

and method (figs. 5, 6), the logic (218) being operative to adjust the successive

approximation value based on the digital signal by performing a single bit iteration when

the amplified signal is outside the range of the multi-bit analog to digital converter,

starting with most significant bit first to least significant bit, until the amplified signal is

within the range of the multi-bit analog to digital converter (figs. 5, 6).

11.   Regarding claim 7, Burns discloses a successive approximation system (fig. 5),

the logic (218) being operative to append a value of the digital signal to the least

significant bits of the successive approximation value after the amplified signal is within

range of the multi- bit analog to digital converter (figs. 5, 6).

12.   Regarding claims 8, 23, Burns discloses a successive approximation system and

method (fig. 5) the logic (218) calibrating the digital signal according to the successive

approximation value (fig. 5)[it is inherent that the logic circuit would calibrate according to the SAR value].

13.   Regarding claim 10, Burn discloses a successive approximation system (fig. 5) wherein the sampling point signals sample the test signal at a sample rate less than the Nyquist rate of the test signal (fig. 5).

14.   Regarding claim 11, Burns discloses a successive approximation system (fig. 5), further comprising a second clock source (210) producing a second clock signal, the pulse generating circuit (212)[col 5, lines 31 – 34] being operative to determine a frequency ratio between the clock source and the second clock source and to employ the frequency ratio for producing the sampling point signals (fig. 5).

15.   Regarding claim 13, Burns discloses a successive approximation system (fig. 5) wherein at least one of the pulse generating circuit (212), memory (218), clock circuit (209), and signal generating circuit (200) are implemented on the same integrated circuit as the circuit under test (202) and the comparison system (206).

16.   Regarding claim 14, Burns discloses a coherent undersampling digitizer (fig. 5), comprising: means (204) for receiving a repetitive test signal from a device under test (202) in accordance with first clock signals, means (the compare result) for producing a difference signal based on the difference between the repetitive test signal and a successive approximation signal means (216) for amplifying the difference signal, and means (220) for converting the amplified difference signal to a multi-bit digital comparison signal (fig. 5).

17.   Regarding claim 15, Burns discloses a coherent undersampling digitizer (fig. 5), the means for converting producing a first signal when the amplified difference signal is outside a range of the means for converting, and producing a second signal indicative of magnitude of the amplified difference signal when the amplified difference signal is within the range of the means for converting (fig. 5).

18.   Regarding claim 16, Burns discloses a coherent undersampling digitizer (fig. 5, the means (212) for producing sampling point signals being responsive to a ratio between the first clock signals and second clock signals and to generate the successive approximation signal based on the multi-bit digital comparison signal (fig. 5).

19.   Regarding claim 17, Burns discloses a coherent undersampling digitizer (fig. 5) the means (212) for producing sampling point signals generating single bit iterations of the successive approximation signal while the first signal is produced and a multi-bit iteration of the successive approximation signal when the second signal is produced (fig. 5).

Allowable Subject Matter

20.   Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21.   Reason for allowing claim 12 will be provided in the next office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Jeanglaude whose telephone number is 571-

272-1804. The examiner can normally be reached on Monday - Friday 7:30 A. M. - 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jean Bruner Jeanglaude
Primary Examiner
October 19, 2004